

## ABSTRACT OF THE DISCLOSURE

A method of producing alkanes containing chlorine by addition of chlorine to C-C double bonds or C-C triple bonds or by exchange of hydrogen for chlorine by contacting the starting compound in the gas or liquid phase with elemental chlorine and  
5 irradiating the reaction mixture with UV light having a wavelength of  $\lambda \geq 280$  nm. In this way pentachloroethane can be produced from trichloroethylene, CFC-113 from HCFC-123 or HFC-133a, CFC-112a from HCFC-142b, or HCFC-123 from HCFC-133a. The method also is suitable for separating photochlorinatable impurities from HFC-365-mfc to obtain purified HFC-365-mfc. Advantages include high yields and  
10 excellent selectivity.